IN THE CLAIMS:

The status and content of each claim follows. *No amendments to the claims are*

proposed by the present paper.

1.   (withdrawn)   A high speed 3D camera comprising:

a monochromatic sensor configured to receive a reflected light pattern from an object to

be photographed;

a plurality of optical pattern filters configured to capture multiple separate sequential

images of said object using said reflected light pattern; and

a computing device configured to combine said sequential images to generate a single

frame image of said object;

wherein said single frame image provides sufficient information to generate 3D image of

said object.

2.   (withdrawn)   The high speed 3D camera of claim 1, wherein said plurality of

optical pattern filters comprise color filters.

3.   (withdrawn)   The high speed 3D camera of claim 2, wherein said plurality of

color filters comprises primary color filters, wherein said plurality of color filters includes one

filter for each primary color.

4.   (withdrawn)   The high speed 3D camera of claim 3, wherein said plurality of optical pattern filters are configured to capture 3 separate sequential images of said object using said reflected light pattern.

5.   (withdrawn)   The high speed 3D camera of claim 1, wherein said plurality of optical pattern filters comprise monochromatic pattern filters.

6.   (withdrawn)   The high speed 3D camera of claim 5, wherein said plurality of optical pattern filters are configured to capture 2 separate sequential images of said object using said reflected light pattern.

7.   (withdrawn)   The high speed 3D camera of claim 1, wherein said single frame image is substantially equivalent in quality to a Rainbow-type image of said object.

8.   (withdrawn)   The high speed 3D camera of claim 1, further comprising a monochromatic light projector configured to generate a plurality of variable intensity pattern sequences similar to a spectral characteristic of said monochromatic sensor.

9.   (withdrawn)   The high speed 3D camera of claim 8, wherein said multiple separate sequential images are captured within a single frame cycle.

10.   (withdrawn)   The high speed 3D camera of claim 9, further comprising:

a plurality of timing trigger circuits communicatively coupled to said monochromatic

sensor, wherein said plurality of timing trigger circuits are configured to generate a plurality of

separate independent expose trigger signals associated with a plurality of independent trigger

signals of said monochromatic light projector.

11.   (withdrawn)   The high speed 3D camera of claim 10, wherein said

monochromatic light projector further comprises a high speed electronically controllable shutter.

12.   (withdrawn)   The high speed 3D camera of claim 8, further comprising:

a plurality of monochromatic sensors disposed around an object; and

a plurality of monochromatic light projectors associated with said plurality of

monochromatic sensors;

wherein each of said monochromatic sensors operates in a unique spectrum band;

said camera being configured to simultaneously acquire a multi-view 3D image of said

object.

13.   (withdrawn)   The high speed 3D camera of claim 1, further comprising a means

for projecting sequential color projections, wherein said means for projecting sequential color

projections comprises one of a rotatable color wheel, a deformable mirror, or a sequential RGB

light emitting diode array.

14.   (withdrawn)   A high speed 3D camera comprising:

a monochromatic sensor configured to receive a reflected light pattern from an object to be photographed;

a plurality of color filters configured to capture three separate sequential images of said object using said reflected light pattern; and

a computing device configured to combine said sequential images to generate a single frame image of said object;

wherein said single frame image is substantially equivalent in quality to a Rainbow-type image of said object.

15.   (withdrawn)   The high speed 3D camera of claim 14, wherein said plurality of color filters comprises primary color filters, wherein said plurality of color filters includes one filter for each primary color.

16.   (withdrawn)   The high speed 3D camera of claim 14, further comprising a monochromatic light projector configured to generate three variable intensity pattern sequences similar to a spectral characteristic of said monochromatic sensor.

17.   (withdrawn)   The high speed 3D camera of claim 16, wherein said three separate sequential images are captured within a single frame cycle.

18.   (withdrawn)   The high speed 3D camera of claim 17, further comprising:

a plurality of timing trigger circuits communicatively coupled to said monochromatic

sensor, wherein said plurality of timing trigger circuits are configured to generate separate

independent expose trigger signals associated with independent trigger signals of said

monochromatic light projector.

19.   (withdrawn)   The high speed 3D camera of claim 18, wherein said

monochromatic light projector further comprises a high speed electronically controllable shutter .

20.   (withdrawn)   The high speed 3D camera of claim 14, wherein said computing

device further comprises a mosaic means configured to combine said three separate sequential

images to form a full color 2D image.

21.   (withdrawn)   The high speed 3D surface image camera of claim 14, further

comprising a means for projecting sequential color projections, wherein said means for

projecting sequential color projections comprises one of a rotatable color wheel, a deformable

mirror, or a sequential RGB light emitting diode array.

22.   (withdrawn)   A Rainbow-type 3D camera comprising:

a light source;

a multiple light projection pattern generator associated with said light source for

generating multiple substantially identical mirror-like gratings for sequential transmission to

illuminate an object to be photographed;

projection optics for projecting said projection patterns towards said object to be

photographed;

imaging optics for focusing reflected radiation patterns from said object towards an

imaging sensor; and

a sensor array including a plurality of imaging sensors.

23.   (withdrawn)   The 3D camera of claim 22, wherein said projection pattern

generator comprises a plurality of mirrors, each of said plurality of mirrors configured to generate

a predetermined reflection pattern.

24.   (withdrawn)   The 3D camera of claim 23, wherein said projection pattern

generator comprises a plurality of mirror gratings, each of said plurality of mirror gratings having

a predetermined phase shift characteristic.

25.   (withdrawn)   The 3D camera of claim 22, wherein the spectral bands of said

imaging sensors and said light source are matched.

26.   (withdrawn)   The NIR 3D camera of claim 22, wherein said projection optics

further comprises a high speed electronically controllable shutter.

27.   (withdrawn)   A near infra red (NIR) Rainbow-type 3D camera comprising:

an NIR light source;

a multiple light projection pattern generator for generating multiple substantially identical mirror-like gratings for sequential transmission to illuminate an object to be photographed;

projection optics for projecting said projection patterns towards said object to be photographed;

imaging optics for focusing reflected radiation patterns from said object towards an NIR sensor; and

a sensor array including a plurality of NIR imaging sensors.

28.   (withdrawn)   The NIR 3D camera of claim 27, wherein said projection pattern generator comprises a plurality of mirrors, each of said plurality of mirrors configured to generate a predetermined reflection pattern.

29.   (withdrawn)   The NIR 3D camera of claim 28, wherein said projection pattern generator comprises a plurality of mirror gratings, each of said plurality of mirror gratings having a predetermined phase shift characteristic.

30.   (withdrawn)   The NIR 3D camera of claim 27, wherein the spectral bands of said NIR imaging sensors and said NIR light source are matched.

31.   (withdrawn)   The NIR 3D camera of claim 27, wherein said projection optics further comprises a high speed electronically controllable shutter.

32.   (previously presented)   A high speed 3D surface imaging camera comprising:

a light projector for selectively illuminating an object to generate 3D image data;

an image sensor configured to receive reflected light from said object and to generate three separate color image data sets based on said reflected light, said three separate color image data sets providing said 3D image data of said object; and

means for generating sequential color projections from said projector onto said object to be photographed;

wherein said image sensor is configured to eliminate cross talk between said sequential color projections by allowing for a sequential exposure of said image sensor within a single frame cycle, said sequential exposure corresponding with said sequential color projections.

33.   (original)   The high speed 3D surface imaging camera of claim 32, wherein said image sensor comprises a plurality of charge-coupled device (CCD) sensors.

34.   (original)   The high speed 3D surface imaging camera of claim 33, wherein said plurality of CCD sensors comprises 3 CCD sensors.

35.   (original)   The high speed 3D surface imaging camera of claim 32, further

comprising a computing device communicatively coupled to said image sensor wherein said

computing device is configured to combine said separate color image data sets into a composite

Rainbow-type image of said object.

36.   (original)   The high speed 3D surface image camera of claim 32, wherein said

means for projecting sequential color projections comprises one of a rotatable color wheel, a

deformable mirror, or a sequential RGB light emitting diode array.

37.   (withdrawn)   The high speed 3D surface image camera of claim 36, further

comprising:

an array of closely spaced light emitting diodes configured to generate a high density

projection pattern; and

driver electronics communicatively coupled to said array of closely spaced light emitting

diodes, wherein said driver electronics are configured to synchronize a projection pattern of light

from said light emitting diodes with said image sensor to achieve optical quality performance.

38.   (withdrawn)   The high speed 3D surface image camera of claim 37, wherein said

array of closely spaced light emitting diodes is further configured to project said high density

projection pattern for a time period not detectible by human eyes.

39.   (withdrawn)   The high speed 3D surface image camera of claim 38, wherein said time period not detectible by human eyes comprises less than 1/1000 of a second.

40.   (withdrawn)   A color camera comprising:

a light projector for projecting sequential light patterns toward an object to be photographed;

a monochromatic sensor to acquire three sequential monochromatic images as the object is illuminated sequentially by said light projector; and

mosaic means for combining the three monochromatic images to form a composite images from sequential light patterns to form a full color 2D image.

41.   (withdrawn)   The color camera of claim 40, wherein said sequential light patterns comprise a red, a green, and a blue light pattern.

42.   (withdrawn)   The color camera of claim 40, wherein said monochromatic sensor is configured to collect said three sequential monochromatic images in a single frame cycle.

43.   (withdrawn)   A means for producing a high speed 3D image comprising:

a monochromatic sensor means for receiving a reflected light pattern reflected from an object;

a plurality of optical pattern filter means for capturing two or more separate sequential images of said object; and

optical pattern combination means for generating a single frame image of said object

based on said reflected light pattern, said frame being equivalent in quality to that of a Rainbow

type image of said object.

44.   (withdrawn)   The means for producing a high speed 3D image of claim 43,

further comprising a monochromatic light projecting means for generating three variable

intensity monochromatic pattern sequences that are similar to the spectral characteristics of said

monochromatic sensor means.

45.   (withdrawn)   The means for producing a high speed 3D image of claim 44,

wherein said means for producing a high speed 3D image is configured to capture said three

separate sequential images of said object within a single frame cycle.

46.   (withdrawn)   The means for producing a high speed 3D image of claim 45

wherein said monochromatic sensor means comprises:

a 3-chip CCD sensor having independent red, green, and blue channels; and

a plurality of timing trigger circuits communicatively coupled to said 3-chip CCD sensor,

wherein said plurality of timing trigger circuits are configured to generate separate independent

expose trigger signals associated with a red, a green, and a blue trigger signal of said light

projecting means.

47.   (withdrawn)   The means for producing a high speed 3D image of claim 46, wherein said monochromatic light projecting means further comprises a high speed electronically controllable shutter.

48.   (withdrawn)   The means for producing a high speed 3D image of claim 46, wherein said timing trigger circuits are configured to eliminate crosstalk between said red, green, and blue channels.

49.   (withdrawn)   The means for producing a high speed 3D image of claim 43, wherein said monochromatic sensor means comprises a plurality of near infrared (NIR) CCD sensors.

50.   (withdrawn)   The means for producing a high speed 3D image of claim 49, further comprising a NIR light projection means for projecting NIR light onto said object.

51.   (withdrawn)   A method for producing a high speed image comprising:

illuminating an object with light having a variable intensity patterns;

imaging said illuminated object with a monochromatic imaging sensor; and

calculating a distance to a point on said object using triangulation based on a baseline distance between said light source and said camera, an angle between said camera and said baseline, and an angle at which light striking the point is emitted by said light source as determined from an intensity of a light striking said point.

52.   (withdrawn)   The method of claim 51, wherein said illuminating further comprises generating sequential color projections onto said object; wherein said sequential light projections are produced by one of a rotatable color wheel, a deformable mirror, or a sequential RGB light emitting diode array.

53.   (withdrawn)   The method of claim 51, wherein said illuminating further comprises illuminating said object with near infrared (NIR) light.

54.   (withdrawn)   The method of claim 53, wherein said imaging comprises imaging said illuminated object with an NIR CCD camera.

55.   (withdrawn)   The method of claim 51, further comprising synchronizing said illumination and said imaging to eliminate crosstalk between different color channels.

56.   (withdrawn)   The method of claim 55, wherein said synchronizing said illumination and said imaging comprises:

generating an independent illumination; and

independently triggering the exposure of a monochromatic sensor disposed within said monochromatic imaging sensor, wherein said independent triggering is synchronized with said illumination.

57.   (withdrawn)   The method of claim 56, further comprising synchronizing said illumination and said imaging to image said object within a single frame cycle.

58.   (withdrawn)   The method of claim 51, further comprising:

sequentially projecting red, green, and blue light on said object;

imaging said illuminated object with said monochromatic imaging sensor, thereby acquiring three sequential images of said object; and

generating a single two-dimensional color image from said three sequential images.

59.   (withdrawn)   The method of claim 51, further comprising:

illuminating an object with light having a variable intensity patterns;

imaging said illuminated object with a plurality of monochromatic CCD cameras to acquire multiple images of said object from a plurality of views, wherein each of said cameras using different bandwidths; and

combining said multiple images to form a full coverage three-dimensional image of said object.

60.   (original)   A 3D camera comprising:

a plurality of monochromatic sensors disposed around an object; and

a plurality of monochromatic light projectors associated with said plurality of monochromatic sensors;

wherein each of said monochromatic sensors is configured to capture images of said object while operating in a unique spectrum band;

said camera being configured to simultaneously acquire a multi-view 3D image of said object.

61.   (original)   The 3D camera of claim 60, further comprising a computing device communicatively coupled to said camera, wherein said computing device further comprises a mosaic means configured to combine said images to form a multi-view 3D image of said object.

62.   (original)   The 3D camera of claim 61, wherein said monochromatic sensors comprise charge-coupled device (CCD) sensors, each sensor including a matched narrow-band spectral filter disposed in front of said CCD sensor.

63.   (original)   The 3D camera of claim 60, wherein each of said plurality of monochromatic light projectors projects light in a unique spectrum band corresponding to one of said monochromatic sensors.

64.   (original)   The 3D camera of claim 63, wherein each of said plurality of monochromatic light projectors is configured to project NIR light, and said monochromatic sensors comprise NIR CCD cameras.